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WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

BOYKIN, TERRESSA M

ART UNIT PAPER NUMBER

1711

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/550,916

Applicant(s)

INADA ET AL.

Examiner

Terressa M. Boykin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12-27-05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-12 are rejected under 35 U.S.C. 102(e) as being anticipated by USP 6703474 see abstract, cols. 1- 10, 21, example 3-1 and 3- 3.

USP 6703474 discloses a polyester resin produced by polycondensing a dicarboxylic acid component containing an aromatic dicarboxylic acid or its ester-forming derivative as the main component and a diol component containing ethylene glycol as the main component in the presence of at least an antimony compound and a phosphorus compound, via an esterification reaction or an ester exchange reaction, which is characterized in that the amount of antimony eluted when immersed in hot water of 95.degree. C. for 60 minutes in the form of particles having a number average particle weight of 24 mg, is not more than 1 .mu.g per 1 g of the polyester resin, as antimony atoms (Sb). The process thus employs a the process of a melt polycondensed resin, more particularly, a solid phase polycondensed resin. Note that bishydroxyethyl is employed in example 3-1 and comparative example 3-3.

Polyester resin, molded product made thereof and process for production of polyester resin.

The reference relates to a polyester resin polycondensed in the presence of an antimony compound, which is to be, used for molding of e.g. bottles, films, sheets

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and fibers, and a process for its production.

It is known that polyester resins such as a polyethylene terephthalate resin has been widely used as various packaging materials such as containers or films, or as fibers, etc., since it is excellent in mechanical strength, chemical stability, and gas

barrier property, hygienics, etc., and is relatively inexpensive and light in weight.

Specifically, the reference relates to a polyester resin (hereinafter referred to as polyester (1)) produced by polycondensing a dicarboxylic acid component containing an aromatic dicarboxylic acid or its ester-forming derivative as the main component and a diol component containing ethylene glycol as the main component in the presence of at least an antimony compound and a phosphorus compound, via an esterification reaction or an ester exchange reaction, which is characterized in that the amount of antimony eluted when immersed in hot water of 95 C. for 60 minutes in the form of particles having a number average particle weight of 24 mg, is not more than 1 .mu.g per 1 g of the polyester resin, as antimony atoms (Sb).

One of preferred embodiments of the reference is a polyester resin is a polyester wherein the ethylene glycol component is at least 96 mol % of the total glycol component, the diethylene glycol component is not more than 2.5 mol % of the total glycol component, the terephthalic acid component is at least 98.5 mol % of the total acid component, the intrinsic viscosity IV is from 0.65 to 1.0 dl/g, and the temperature-lowering crystallization temperature T_{c2} is from 150 to 200C. According to this embodiment, even if the copolymerized amount is particularly small and the intrinsic viscosity is low, the crystallization rate is low, whereby when formed into a container such as a bottle, it is possible to obtain a container having excellent transparency, heat resistance and strength at high productivity, such being particularly suitable for a hollow container for a non-

carbonized beverage such as mineral water, tea or juice.

Further, another gist of the present invention resides in a process for producing a polyester resin, which comprises polycondensing a dicarboxylic acid component containing an aromatic dicarboxylic acid or its ester-forming derivative as the main component and a diol component containing ethylene glycol as the main component, characterized in that a catalyst is added to the reaction system so that the following respective atoms derived from the catalyst will be contained in the following concentration ranges based on the obtainable polyester resin:

FIGS. 1: (a) is a plan view and (b) is a front view, of a stepped molded plate for evaluation of the physical properties, molded in Examples.

Further, the polyester resin of the present invention is characterized in that the haze in a thickness of 5 mm of a molded product after injection molding at 270 C. is not more than 50% (the above polyester 5), preferably not more than 30%, more preferably not more than 20%, particularly preferably not more than 10%. If this haze exceeds the above range, the transparency as molded into a bottle at a low temperature, tends to be poor, and accordingly, the molding is obliged to be carry out at a high temperature, whereby it will be impossible to adequately suppress formation of acetaldehyde or contamination of the mold during the molding.

Further, the polyester resin of the present invention is such that the difference between the cyclic trimer content (see reference for amount) of the resin in a molded product after injection molding at 270 C. and the cyclic trimer content (see reference for the content) of the resin before the injection molding, is preferably not more than 0.05 wt %, more preferably not more than 0.03 wt %, particularly preferably not more than 0.01 wt %. If this value .DELTA.CT exceeds the above range, contamination of the mold tends to result at the time of molding

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into a bottle or the like.

As a preferred process for producing the polyester resin a process for comprises polycondensing a dicarboxylic acid component containing an aromatic dicarboxylic acid or its ester-forming derivative as the main component and a diol component containing ethylene glycol as the main component, characterized in that a catalyst is added to the reaction system so that the following respective atoms derived from the catalyst will be contained in the following concentration ranges based on the obtainable polyester resin:

Further, the polyester resin of this embodiment contains a compound of a metal element of Group IA or IIA of the periodic table and a phosphorus compound, from the viewpoint of the polycondensability, reduction of by-products such as acetaldehyde and cyclic trimers, as well as the transparency, the color tone, etc. of the obtainable resin. It preferably contains the above compounds of metal elements in an amount of from 0.2 to 5 mol/ton (from 5 to 121 ppm) as the total (M) of such atoms and the phosphorus compound in an amount of from 0.1 to 6.5 mol/ton (from 3 to 200 ppm) as phosphorus atoms (P). It is more preferred that it contains the above-mentioned metal element compounds in an amount of from 0.3 to 3 mol/ton (from 8 to 72 ppm) as the total (M) of their atoms and the phosphorus compound in an amount of from 0.2 to 2 mol/ton (from 7 to 61 ppm) as phosphorus atoms (P).

In the polyester resin of this embodiment, the content of the antimony compound is from 0.08 to 2 mol (from 10 to 243 ppm), preferably from 0.2 to 1.7 mol (from 25 to 206 ppm), as antimony atoms (Sb), per 1 ton of the polyester resin. If the content as antimony atoms (Sb) in the antimony compound is less than the above range, the polycondensability tends to deteriorate, and the content of *cyclic trimers*, etc. as by-products, tends to be large. On the other hand, if it exceeds the above range, elution of the antimony compound tends to

increase, when used as a bottle or the like.

The polyester resin of this embodiment is such that the intrinsic viscosity is preferably from 0.6 to 1.0 dl/g, more preferably from 0.7 to 1.0 dl/g. If the intrinsic viscosity is less than the above range, the mechanical strength as the polyester resin tends to be inadequate, and uniform stretching tends to be difficult in molding such as stretch blow molding. On the other hand, if it exceeds the above range, the moldability tends to deteriorate, and there will be a problem that in molding such as stretch blow molding, the molded product is likely to break by the blow pressure.

With regard to claim 5, specifically, the aromatic dicarboxylic acid or its ester-forming derivative may, for example, be terephthalic acid, phthalic acid, *isophthalic acid*, etc.

Further, with regard to claim 7 at the time of the production of a molded product, usual additives such as a nucleating agent, a lubricant, a *stabilizer*, an antistatic agent, an antifogging agent, a colorant, etc., may be incorporated, as the case requires.

The reference discloses a polyethylene terephthalate prepared from the same components as claimed by applicants. Note that the reference is aware of keeping the content of by-products or cyclic trimer low by keeping the antimony within a specific amount. Further, with regard to claims 1-6, 8-12, any properties or characteristics inherent in the prior art, e.g. ion content, acid value, etc., although unobserved, unmentioned or detected by the reference, would still anticipate the claimed invention since the resulting polyethylene terephthalate composition has the same characteristics and low content of by-products, i.e. cyclic trimers, and may be used for the same articles as disclosed by applicants

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in the specification on pages 1 and 2 when compared to those of the reference in col. 21. Note In re Swinehart, 169 USPQ 226. "It is elementary that the mere recitation of a newly discovered...property, inherently possessed by things in the prior art, does not cause claim drawn to those things ". Since the disclosed amounts and contents although disclosed, are expressed differently, i.e. ppm, mol% wt%, they nevertheless appear to be the same as those claimed and thus are not distinguishable over the prior art. In view of the above, there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 6703474 see abstract, cols. 1-10, 21, example 3-1 and 3-3.

The reference discloses a polyethylene terephthalate as disclosed above that may be used for molded articles prepared from the same components as claimed by applicants except for the specific amount of cyclic trimer content of 2,000 ppm

or less as disclosed herein.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the process, which has a low content of by-product specifically a cyclic trimer since the low content of by-product of cyclic trimer of specifically 2000 ppm or less as claimed although not specifically written as such in the reference, *is* written as "preferably not more than 0.05 wt %, more preferably not more than 0.03 wt %, particularly preferably not more than 0.01 wt %" and appears to be within the claimed range as disclosed by applicants. Further, since the resulting mold may be used for the same articles and thus appears to have the same or overlapping characteristics, i.e., intrinsic viscosity is from 0.65 to 1.0 dl/g, the reference appears to be inherently obvious.

Consequently, the claimed invention cannot be deemed as unobvious and accordingly is unpatentable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terressa M. Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Terressa M. Boykin
Primary Examiner
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